

Project 6/2004 – Ecological and physiological response of Hong Kong coral communities to changing temperature and oxygen levels

Purpose

This paper seeks Members' advice in funding the captioned application for ECF made by the City University of Hong Kong

Background

2. The funding requested by this project is \$1,981,654.00, including -
- (a) \$1,206,954.00 covering the staff cost of one Research Fellow and one Senior Research Assistant;
 - (b) \$567,000.00 for purchase of equipment including \$400,000.00 for two data logger and hydrography sensors for temperature, salinity, dissolved oxygen, pressure, light intensity and current meter; and
 - (c) \$207,700.00 for general expenses on transportation, hiring divers, chemicals and consumables, DNA sequencing and maintenance of equipment.

The project is expected to last for 2 years.

3. The aim of this project is to study the behavioural and physiological responses of local corals and their associated reef fish communities in Hoi Ha Wan Marine Park with respect to changing environmental factors, especially dissolved oxygen, salinity and temperature. The detailed objectives of the project are as follows -

- (a) To investigate the relationship between the behavioural stress response of corals, i.e., bleaching and polyp swelling, to environmental factors, in particular, dissolved oxygen, salinity and temperature.
- (b) To identify biomarkers in corals for assessing environmental stress especially when low oxygen levels prevail.
- (c) To investigate the changes in species diversity of coral fish in relation to changing environmental factors.
- (d) To integrate the results of the above studies and identify physiological and behavioural adaptations of coral and coral fish to adverse conditions. The study will create a predictive model and flow chart to identify the interaction between environmental conditions and coral community

responses and thus enable appropriate predictions for marine park management, such as restricting access to corals during periods when they are exposed to hypoxic waters or when they are releasing gametes. The objective is to enable better management of the marine park based on knowledge of the biology of the corals and fish, such that the long term survival of coral communities in Hoi Ha Wan are preserved.

4. The proposal was examined by AFCDC and two external expert assessors. AFCDC supported the proposal in principle from marine conservation point of view. As there is little knowledge in the subject area, AFCDC considered that the study findings would -

- (a) provide a better understanding on the ecological and physical responses of Hong Kong coral communities with respect to changes in environmental factors;
- (b) help to determine the threshold tolerance level and biological responses of selected coral species under different environmental stresses; and
- (c) provide scientific information for park management decisions, such as restricting access and activities to coral sites during sensitive periods.

5. In respect of the assessment from the two external expert assessors, Assessor 1 supported the proposal as the proposed works will provide necessary scientific basis and tools for better protection of HK's coral communities. On the other hand, Assessor 2 considered the project not worthy of support and the work plan is not too realistic. Assessor 2 also considered the budget excessively high for both equipment and staff cost, in particular, the skills needed are not exceptionally specialized and thus the high cost for a senior research assistant and a research fellow is not justified.

Advice sought

6. Members are invited to advise whether the application for ECF should be supported with an approved grant of \$1,981,654.00 as detailed in paragraphs 2 to 3 above.